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REPORT ON THE WHITE DWARF SURVEY OF THE SOUTHERN HEMISPHERE

By Willem J. Luyten

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REPORT ON THE WHITE DWARF SURVEY OF THE SOUTHERN HEMISPHERE

By Willem J. Luyten

1. One of the primary purposes in undertaking the Bruce Proper Motion Survey of the Southern Hemisphere was to provide the basic material from which a further search for White Dwarfs could be started. Naturally the probability of finding white dwarfs is greatest among the stars of largest proper motion; all stars with motions in excess of 0″.5 annually were therefore observed first. Color observations on these stars were made possible through the cooperation of Dr. E. F. Carpenter at the Steward Observatory, Tucson, Arizona and Dr. E. Gaviola and Mr. Martin Dartayet of the Cordeba Observatory in Argentina. These observations were completed by 1945 and a total of 26 new white dwarfs were found.

Since then the color survey has been extended to include (a) all stars with motions between 0″.3 and 0″.5 annually, and (b) all components of wide pairs with common proper motion. All observations under (a) for stars south of declination −50 have been completed at Cordoba by Mr. David McLeish and 23 new white dwarfs have been found and announced. Observations for the stars with declinations north of −40 are in progress at Tucson but their completion will take many more years especially since to date motions have not been measured for stars north of declination −20. All stars under (b) within reach of the 36″ telescope at Tucson have been observed by Dr. P. D. Jose and the writer and 11 new white dwarfs have been found and announced.

2. When the completion of these several programs was approaching it became evident that the efficiency attainable by this type of observation — where only the field of one proper motion star at a time was photographed with a large telescope — was also reaching its limit. Obviously, color observations, one by one of, say, stars of the sixteenth magnitude with proper motions of 0″.050 annually do not constitute an efficient way of finding new white dwarfs, nor even an efficient way of utilizing a large telescope. Since a few probable white dwarfs had been found among faint stars with rather small proper motions and also because of the signal success attained by Humason and Zwicky in their search for blue stars in high galactic latitude a plan was conceived to rephotograph the entire southern hemisphere on yellow-sensitive emulsions down to the limit of the original proper motion survey. If such plates were taken with the same Bruce telescope with which the original proper motion plates had been taken and if the yellow plate was compared with one of the blue plates in the blink

microscope it was hoped that a color survey of all the stars found to possess appreciable motion could be completed in a reasonably short time.

3. To put this plan into execution two grants were received from the Rumford Fund of the American Academy of Arts and Sciences which were sufficient to provide all the yellow plates necessary for coverage of the region south of declination −45. The Harvard Observatory kindly offered to have these plates taken as part of its regular observing program and all 361 plates required were actually taken between 1947 and 1950 — before the Bruce telescope was dismantled.

All plates used were of emulsion 103aE and were taken through a #12 "minus blue" filter and given uniform exposures of 45 minutes. One of the pleasant surprises encountered was that these new yellow emulsions were so fast that, except for some unavoidable accidents due to sky-transparency, exposure, or development, the new 45 minute exposures show virtually all stars found on the old blue plates, some of which had exposures up to four hours. The old plates were all 14 × 17 inches in size, and were taken in such a way as to provide a considerable overlap in right ascension but only a very small one in declination. The largest yellow filter that could be obtained for this program measured only 11 × 14 inches in size; consequently a few stars were lost at the extreme north and south sides of the plates, but virtually none on the east or west sides.

The present set of yellow plates, in conjunction with the earlier blue plates constitutes, therefore, the first virtually complete color coverage down to the sixteenth magnitude for any large part of the sky.

4. All plates south of declination −60, numbering 169 in all have now been examined and the present paper gives a summary of the results obtained and the conclusions reached from that examination. For each of the 169 regions the oldest blue plate — generally taken around 1899 — was compared with the new yellow plate in the blink microscope. In the majority of cases the markings identifying the proper motion stars had been preserved on the glass side of the old plates but in any case the nearly 50 year interval between the blue-yellow pair served as an additional check. This not only greatly reduced the time spent on the otherwise tedious job of identification — especially so in rich Milky Way fields — but also ensured complete certainty of identification in doubtful cases as well as reascertaining the reality of the originally recorded proper motion — in direction as well as in approximate amount at the same time that the color comparison was made.

Since the majority of proper motion stars is red, their images are generally stronger on the yellow plates than on the blue plates whereas the reverse is true for stars whiter than the background. These latter therefore stand out in the usual blink procedure because their apparent

variability goes contrary to the general run. In addition, the blink procedure followed undoubtedly allows the observer to see and estimate colors for stars very much fainter than would be the case if the two plates were compared side by side. In fact, this observer is convinced that he can thus estimate the color of many stars which are really invisible on the yellow plates — provided, of course, they are not too much invisible.

5. Where the number of stars to be examined is close to 40,000 it

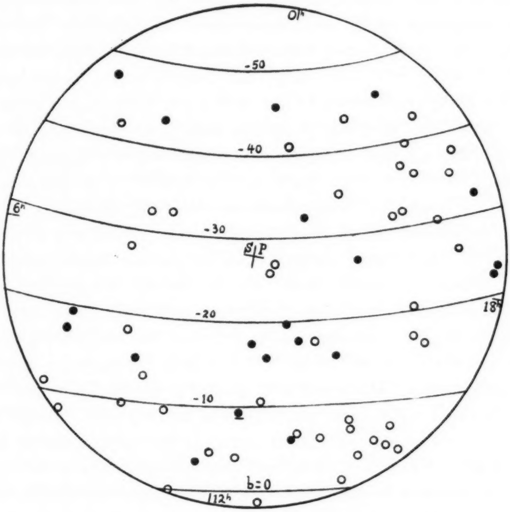

FIGURE I. Distribution of seventy probable White Dwarfs south of $-60°$.
Dots: stars with proper motions larger than $0''.3$ annually.
Open Circles: stars with proper motions less than $0''.3$ annually.

would obviously not have been feasible to make accurate estimates of the color index for each star. After a few trials it was found that a rough classification into four groups could be made quickly enough to enable one observer to complete the survey in a few years and yet obtain results which appear to be significant. These four groups are:

(a) Stars that stand out as extremely red; these probably comprise mostly stars with spectral class M and even late M. Nearly all the faint stars with very large proper motions belong to this group.

(b) Stars which appear somewhat redder than the background stars; probably comprising chiefly late K and early M spectra.

(c) Stars of about the same color as the background stars, and probably mostly belonging to spectral classes G and K.

(d) Stars definitely less red than the background. Among these the real white dwarfs are to be found.

By using again the original ledgers employed in blinking the plates for proper motion it was found that examination and recording of the stars in the above groupings could be accomplished in somewhat less than one minute per star. Groups a–c were recorded in these original ledgers in red pencil as R, r, nvr (not very red) respectively; these designations are now also being transferred to the permanent filing cards in the general catalogue. The stars of group d are the only ones meriting individual attention; for them a rough estimate of the color index relative to from five to ten comparison stars was made to the nearest $0^{m}.1$ and recorded in blue pencil. It cannot be emphasized too strongly that there remains an element of arbitrariness and subjectivity in this procedure: on some days the observer is much more "generous" in his classifying stars under group d than on others. It would seem to the present writer that, short of adopting an elaborate and time-consuming procedure involving accurate measurements of the color index for each star this subjectivity is merely one of the penalties one has to pay if the whole survey is to be completed in a reasonable time. Moreover it is doubtful whether any real accuracy could be obtained with these plates, taken as they are through a yellow filter, with a four component lens corrected for photographic light (the image of Alpha Centauri is fully one centimeter in diameter). The uncertainties introduced by the observer's erraticness — or by the variability of the plates or the instrument — may ultimately be estimated and corrected for by an analysis of the color estimates made for the same star on two different, overlapping plates, and there should be several thousand cases of this kind.

Some by-products of the present survey may be briefly mentioned:

(a) Many errors in the determination of position, magnitude, cataloguing and even of identification have come to light as a result of the color survey.

(b) In the original survey many stars were indicated as possibly possessing a proper motion but some doubt remained even after measurement as often the uncertainty was due to an irregularity of the image on one of the plates. Now that a fifty-year interval instead of a thirty-year one is available many of these doubtful motions can be checked — shown to be either definite or illusory. Also, as has happened in several instances, the

finding of a faint star with a doubtful proper motion as very white is usually a good indication that the motion is spurious.

6. Perhaps the most outstanding impression obtained from the examination of the first 169 pairs of plates is the extraordinary redness of some Milky Way regions where almost every proper motion star is *less* red than the background. Often this redness due to obscuration can be recognized, more often perhaps it is not and then merely adds to the uncertainties in the resulting color indices which obviously must be regarded as highly provisional. Even so, it has been thought worth while to publish detailed results for all stars classified under group d. These have been divided into two further groups, the first, and much the smaller one comprising those stars which from an analysis of their magnitude, proper motion and color appear to possess the greatest probability of being genuine white dwarfs. Owing to the very considerable uncertainties in the adopted color indices no one, and certainly not the present writer would believe that they all actually are white dwarfs. Possibly no more than one third of them are genuine white dwarfs while the others more properly belong to that group of stars intermediate between the main sequence and the white dwarfs, some perhaps may be ordinary red main-sequence stars lying in heavily obscured regions where insufficient allowance has been made for the redness of the background. While the stars herewith announced as probable white dwarfs may thus be individually in error the present writer believes that, statistically, they represent the best estimate in number, and kind that can now be made from the existing material. For every star which ultimately will be rejected from this list another should be found from the much larger number in the general group d to take its place.

Incidentally, it may be pointed out that since the blue and yellow plates used were taken at widely different times, the possibility that an occasional eclipsing variable slips in as a white dwarf should not be overlooked.

Data for those stars, 44 in number, which had not previously been announced as probable white dwarfs are shown in Table I where the different columns give, in order, the star's designation, both the BPM and L numbers, the position for 1950, the apparent photographic magnitude, the total annual proper motion and its direction, and the estimated color index.

Table II shows, similarly, the data for the 27 white dwarfs south of declination -60 announced previously; the last column here gives the reference to the discovery announcement. All these stars were found again in the present survey with the exception of BPM 7756, 11534, and 13870. These stars are so faint — and so white — that they do not show on the present yellow plates; but in each case the notation made at the time of the color examination was: "invisible, probably blue". This suggests that a few white dwarfs may have been similarly missed because they are too

Table I

BPM	L	R.A. 1950 h m	Dec ° ′	m	μ ″	p °	I.C.
3116	91–71	3 42.0	−67 19	15.3	0.111	30	0.0
3523	31–99	4 46.5	−78 57	13.1	.061	255	−0.1
3638	31–34	5 06.6	−76 38	16.0	.124	167	0.2
4225	32–11	6 24.4	−75 40	15.1	.086	17	0.1
4400	33–11	7 01.5	−75 13	14.3	.062	127	0.2
5102	63–60	8 48.1	−73 02	15.2	.111	291	0.0
5109	139–26	8 50.0	−61 43	14.5	.093	300	0.0
5401	140–38	9 17.6	−60 36	14.6	.046	8	0.0
6082	64–27	9 54.6	−71 02	14.4	.174	215	0.0
6114	101–26	9 57.8	−66 39	15.1	.072	344	0.0
6502	101–80	10 42.6	−69 02	14.0	.278	267	0.1
6961	67–5	11 26.8	−70 32	12.6	.114	254	0.0
7263	103–45	11 57.5	−66 04	16.0	.130	312	0.1
7543	104–2	12 23.8	−65 56	15.0	.186	182	0.0
7961	69–47	12 57.9	−72 18	15.0	.187	100	0.0
8474	148–42	13 40.7	−61 59	14.6	.067	115	0.1
9040	150–52	14 36.9	−62 45	16.2	.133	228	0.0
9085	107–29	14 41.6	−66 10	15.5	.10:	210	0.2
9164	108–66	14 49.3	−67 03	14.9	.058	297	0.0
9216	151–81	14 54.0	−63 05	17.0	.044	180	0.2
9306	151–60	15 02.1	−62 34	15.9	.069	277	0.2*
9323	41–26	15 04.9	−77 00	15.5	.071	54	0.1
9402	151–31	15 11.5	−61 42	15.5	.071	232	0.3
9483	108–124	15 20.0	−68 47	15.0	.110	110	0.1
9949	153–155	16 06.1	−63 14	13.2	.085	44	0.1*
10197	154–122	16 28.7	−62 21	16.2	.087	190	0.2
890	8–61	16 28.8	−87 17	15.0	.085	51	0.0
10552	111–44	17 02.4	−67 05	13.4	.061	173	0.2
10564	111–75	17 03.7	−68 41	14.9	.106	168	0.2
921	7–44	17 08.8	−87 08	15.0	.156	60	0.0
11316	157–64	18 15.3	−62 35	15.8	.062	194	0.2
11655	113–132	18 37.3	−69 31	15.6	.126	188	0.4
11995	114–29	18 57.8	−65 32	14.6	.086	177	0.2
12527	114–353	19 30.1	−67 16	14.8	.129	194	0.3
12772	79–51	19 48.9	−71 57	15.8	.140	168	0.3
12843	80–56	19 53.2	−71 31	15.4	.219	180	0.0
13163	162–217	20 19.1	−64 34	16.8	.126	184	0.3
13491	116–79	20 39.6	−68 16	13.5	.247	138	0.0
13537	162–160	20 43.0	−63 31	16.2	.044	131	0.1
13673	117–181	20 54.7	−69 09	16.9	.063	148	0.3
13853	47–70	21 10.9	−77 37	15.6	.042	144	0.2
14184	164–165	21 34.8	−64 45	15.0	.153	164	0.3
14942	83–2	22 35.0	−69 57	14.0	.068	186	0.2
15727	26–23	23 37.7	−76 03	14.8	.260	241	0.4

* Probably strong obscuration in these fields.

faint to show on the present yellow plates. For BPM 1266 = L24–52 the Harvard color plates indicate a considerably yellower color than did the Cordoba plates.

The remaining stars of group d were all found to be less red than expected but not blue enough to consider them as probable white dwarfs. Stars of high luminosity and large, positive color-index are universally

TABLE II

BPM	L	R.A. 1950	Dec	m	μ	p	I.C.	H.A.C.
		h m	° ′		″	°	m	
1595	50–73	0 11.4	−72 06	15.5	0.34	136	0.2	1132
2819	54–5	2 55.8	−70 34	14.0	0.67	98	0.1	609
2890	127–73	3 10.4	−62 28	15.2	0.39	84	0.1	1132
4729	97–12	7 52.8	−67 38	15.0	2.05	135	0.4	602
4834	97–3	8 06.4	−66 09	13.6	0.47	128	0.0	926
5639	64–40	9 28.6	−71 20	16.2	0.43	313	0.2	926
7108	145–141	11 42.9	−64 34	12.5	2.68	97	−0.3	602
7567	68–27	12 25.6	−71 13	17.7	1.17	339	1.0	699
7568	68–28	12 25.6	−71 13	15.7	1.17	339	1.1	699
7756	38–80	12 41.3	−79 53	17.4	0.57	308	0.2	712
7855	147–11	12 48.4	−61 02	15.5	0.08	263	−0.1	1132
8163	40–116	13 14.8	−78 09	17.0	0.47	145	0.5	926
8394	106–73	13 34.5	−67 49	16.1	0.54	263	−0.3	699
8436	106–77	13 37.5	−67 55	15.3	0.11	291	0.0	699
8752	106–24	14 06.3	−66 27	15.6	0.06	329	0.0	1134
8795	149–54	14 09.3	−62 03	15.0	0.11	236	0.2	1134
784	19–2	14 25.4	−81 07	13.0	0.45	208	0.0	926
9025	40–109	14 36.9	−78 10	16.6	0.41	276	0.4	1134
9518	72–91	15 24.3	−74 55	16.7	0.44	238	−0.4	926
11534	158–61	18 28.5	−62 01	16.6	0.25	205	0.2	926
11593	44–95	18 34.7	−78 09	15.2	0.33	161	0.0	984
11668	158–53	18 37.6	−61 56	15.2	0.39	226	0.2	984
12743	160–108	19 44.8	−63 07	11.8	0.44	186	0.2	—
1266	24–52	21 05.2	−82 01	14.4	0.37	168	0.2	984
13870	117–117	21 11.0	−67 14	17.3	0.07	171	0.1	984
14525	48–15	21 59.8	−75 28	14.9	0.52	279	0.1	1142
14703	119–34	22 16.2	−65 44	14.8	0.65	161	0.0	699

called red giants; in the accepted way of drawing the Hertzsprung-Russell diagram these stars lie at the upper right. Stars of very low luminosity and negative or only slightly positive color index are generally called white dwarfs; these occupy the lower left corner of the H-R diagram. But here the consensus of opinion ends and confusion begins. Most astronomers term the locus in the H-R diagram running from upper left to lower right, i.e., from the highly luminous O stars to the feebly luminous M stars the

main sequence. Eggen, however, calls Vega (M = 0.4 AO) a "bright blue dwarf"; on this system an ordinary highly luminous early O star should be called a "bright violet dwarf", though it is more than a thousand times as luminous as a +3.0 KO star which Kuiper calls a "sub-giant". Kuiper calls the stars between the main sequence and the white dwarfs "subdwarfs" or underluminous stars, but such a subdwarf of M = + 5, AO is only 100 times *less* luminous than an ordinary A star of the main sequence but 1,000 to 10,000 times *more* luminous than some white dwarfs of the same color. Up to now it has not been possible to locate and classify all these stars with certainty in the H-R diagram from either color, spectral class, or proper motion observations or a combination of them. Since observations for parallaxes of very faint stars with large telescopes are no longer popular it does not seem likely that the present confusion and chaos in nomenclature will soon resolve itself. Ultimately when matters become clarified, we may well have to resort to such classification as "main-sequence", "semi-degenerate" and "degenerate", and perhaps more, but until such time comes the present writer prefers to adhere to the simple descriptive term proposed by Adams viz., "intermediate" to designate those stars that lie between the main sequence and the white dwarfs, in addition to retaining the terms "main sequence" and "white dwarfs". While this may lack precision it is at least consistent and avoids ambiguity as much as possible.

Conforming to this terminology then, the majority of stars in groups a, b, and c, probably belong to the main sequence, those listed in Tables I and II are probable candidates for white dwarfs, and the remainder of the stars in group d may provisionally be classified as intermediates. Data for them are given in Table III which is arranged in precisely the same manner as Tables I and II and therefore needs no further explanation.

7. The distribution over the sky of all 65 probable white dwarfs found south of declination −60 is shown in figure 1. The more certain cases, i.e., those found on Cordoba plates, and having large proper motions are represented by solid circles (except BPM 7855, 8436, 8752, 8795, and 13870 which have motions of 0″.1 or less and were only found incidentally in the Cordoba search); those found in the present survey are shown as open circles.

There is some suggestion of galactic concentration but actually this may mean no more than that some galactic regions, because of their strong reddening contain a larger proportion of spurious white dwarfs. The greater concentration of dots in the right hand half of the diagram merely reflects the fact that most of the long-exposure plates are concentrated between 11 and 20 hours of right ascension.

8. No great accuracy can be claimed for any phase of the present sur-

vey — it is indeed no more than just that, a rapid survey of the approximate colors of a large number of stars with appreciable proper motion. Whatever later observations may indicate to be the real accuracy — or lack of it — of the present data, the least that may be said for the present survey is that it has narrowed down the search for white dwarfs from an original total number of 16,000 stars to as few as 800 odd probables and possibles.

In conclusion it is a pleasure to express the author's indebtedness to the Rumford Committee of the Academy for having made possible this investigation, and to Dr. Harlow Shapley, director of the Harvard College Observatory not only for his willingness to have this large program added to the already heavy burden of the Harvard Southern Station, but also for his continued interest in it and his placing all the needed facilities of the Harvard Observatory at the disposal of the execution of this research.

Minneapolis, Minn.,
21 July 1951

TABLE III

BPM	L	R.A. 1950	Dec	m	μ	p	I.C.
		h m	° ′		″	°	
2	10–47	0 04.0	−83 38	14.9	0.170	90	0.4
70	11–3	1 10.9	−80 36	13.7	.337	220	0.7
88	3–18	1 26.2	−86 50	13.7	.080	135	0.6
131	12–17	2 22.3	−81 16	12.8	.035	109	0.7
137	12–5	2 32.4	−80 30	14.7	.099	262	0.5
181	12–33	3 29.1	−82 22	13.7	.044	225	0.4
182	12–49	3 29.0	−83 38	15.4	.050	225	0.6
192	13–54	3 48.7	−83 55	13.9	.066	321	0.4
211	13–12	4 17.7	−81 18	13.6	.295	85	0.7
214	13–30	4 22.8	−82 21	15.0	.056	238	0.7
279	2–180	4 57.	−89 34	15.1	.083	295	0.5
295	14–27	6 34.6	−82 39	14.2	.123	120	0.5
409	15–30	8 00.2	−81 15	15.0	.148	144	0.5
420	15–40	8 12.0	−81 25	15.0	.117	170	0.4
464	16–79	8 54.5	−83 33	12.3	.167	161	0.3
543	5–30	9 42.2	−86 54	15.0	.135	180	0.6
645	18–8	11 48.2	−81 07	14.5	.130	97	0.4
702	39–47	13 08.9	−80 21	15.6	.103	110	0.7
769	19–61	14 15.1	−83 19	15.4	.060	70	0.3
772	19–78	14 18.0	−85 01	13.8	.157	73	0.3
888	7–22	16 27.2	−86 13	13.2	.060	136	0.2
922	21–50	16 58.6	−83 50	14.8	.195	91	0.4
939	21–14	17 07.5	−81 04	14.2	.142	109	0.4
1052	22–25	18 27.6	−80 50	14.4	.210	117	0.5
1087	23–29	18 49.8	−81 52	15.0	.071	357	0.4

BPM	L	R.A. 1950	Dec	m	μ	p	I.C.
		h m	° ′		″	°	
1123	9–36	19 21.0	−85 45	14.1	.045	104	0.5
1138	9–18	19 25.2	−84 47	11.8	.112	80	0.2
1221	9–48	20 46.8	−86 42	14.2	.042	111	0.5
1236	24–49	20 48.6	−81 52	16.0	.153	152	0.7
1261	24–117	21 04.2	−84 27	14.0	.065	86	0.6
1302	24–11	21 29.0	−80 25	15.4	.154	92	0.4
1347	9–43	22 06.4	−86 27	15.7	.044	266	0.7
1352	24–63	22 03.8	−82 08	15.4	.087	117	0.6

For these stars, all south of declination −80°, the direction of the proper motion is referred to the hour circle of 0^h RA passing through the South Pole, for all other stars it is referred to the usual hour circle passing through the star.

BPM	L	R.A. 1950	Dec	m	μ	p	I.C.
1508	26–57	0 03.1	−77 20	14.9	0.111	153	0.5
1531	169–95	05.3	−62 43	15.0	.069	109	0.5
1611	122–67	12.9	−62 39	11.6	.066	9	0.7
1629	122–80	14.2	−63 44	14.2	.060	108	0.7
1650	86–94	15.9	−69 08	17.2	.162	84	0.9
1693	50–53	20.8	−71 39	13.6	.084	121	0.6
1702	86–17	22.4	−65 55	14.8	.132	104	0.6
1719	50–69	24.0	−72 04	13.3	.049	119	0.2
1727	50–84	24.6	−72 23	14.8	.051	53	0.5
1760	26–21	27.8	−76 03	11.9	.400	154	0.5
1824	122–4	34.2	−60 13	14.3	.282	69	0.4
1849	122–55	38.2	−62 15	14.5	.204	161	0.6
1850	50–128	38.2	−73 22	12.8	.059	133	0.6
1858	122–52	39.1	−62 03	13.6	.077	78	0.6
1865	50–90	39.7	−72 29	13.7	.051	170	0.3
1938	87–5	51.5	−65 12	12.1	.143	102	0.6
1995	124–46	1 00.7	−62 07	13.8	.156	85	0.6
2059	87–71	08.7	−68 04	14.0	.071	149	0.5
2081	52–95	11.6	−73 09	13.5	.041	243	0.4
2105	123–15	14.7	−60 33	14.6	.131	94	0.4
2110	123–31	15.2	−61 24	12.4	.079	74	0.4
2111	51–8	15.2	−70 26	12.4	.182	82	0.6
2145	123–83	18.8	−63 48	13.2	.119	237	0.4
2155	124–58	21.0	−62 45	11.0	.062	73	0.5
2194	124–66	26.6	−63 20	10.8	.213	114	0.4
2195	88–62	26.5	−67 30	15.0	.080	70	0.7
2205	124–20	28.8	−61 00	13.4	.078	81	0.6
2207	88–13	28.8	−65 18	11.5	.096	63	0.6
2228	52–42	31.2	−71 56	14.5	.035	128	0.6
2352	88–26	46.1	−66 22	14.0	.048	220	0.7
2443	28–10	57.1	−75 35	13.6	.043	187	0.2
2452	88–36	2 00.8	−66 45	15.0	.065	152	0.4*
2458	125–44	01.8	−62 54	15.6	.130	187	0.7
2482	53–32	04.2	−72 08	13.9	.083	241	0.5
2519	125–4	10.4	−59 55	13.8	.056	37	0.6

BPM	L	R.A. 1950	Dec	m	μ	p	I.C.
		h m	° ′		″	°	
2523	89–82	2 10.9	−69 17	14.9	.073	84	0.6
2540	126–50	14.0	−63 32	13.5	.059	107	0.6
2568	28–25	16.5	−76 58	14.2	.097	349	0.4
2569	53–25	17.8	−71 34	13.6	.080	129	0.5
2664	28–13	29.1	−75 45	13.3	.200	141	0.3
2697	126–11	35.4	−61 08	12.1	.224	75	0.5
2872	127–3	3 06.4	−60 10	15.1	.106	161	0.7
2885	127–75	09.4	−62 37	15.0	.114	67	0.6
2911	91–39	14.6	−66 15	13.2	.057	156	0.5
3066	91–132	35.6	−68 44	13.6	.091	148	0.4
3206	91–23	51.2	−65 59	13.1	.062	99	0.7
3273	30–31	59.6	−76 59	15.2	.150	4	0.6
3288	56–43	4 04.0	−72 28	12.5	.077	312	0.5
3290	129–30	05.3	−72 10	11.9	.056	28	0.2
3303	130–44	08.0	−62 35	13.8	.043	160	0.4
3307	92–33	07.5	−69 23	11.9	.129	34	0.6
3320	55–41	09.5	−71 57	12.6	.202	70	0.4
3340	92–39	15.5	−68 59	14.4	.142	169	0.7
3357	130–58	19.1	−64 06	12.6	.103	23	0.5
3403	56–41	22.3	−72 21	13.7	.262	88	0.7
3417	56–35	24.5	−72 12	12.8	.314	38	0.6
3418	130–21	25.9	−61 44	13.3	.065	83	0.6
3481	31–67	37.6	−77 45	15.4	.042	204	0.5
3485	93–17	40.6	−66 06	12.5	.114	135	0.4
3492	56–44	40.6	−72 42	13.7	.063	350	0.5*
3518	131–4	49.2	−60 50	13.0	.173	71	0.5
3573	57–27	56.2	−71 24	12.2	.215	28	0.4
3585	31–51	55.8	−77 25	13.3	.082	65	0.5
3588	131–15	58.9	−63 19	13.8	.095	184	0.7
3595	57–50	59.9	−72 33	14.7	.071	191	0.7
3608	93–23	5 03.1	−66 27	12.0	.202	13	0.5
3643	31–81	06.5	−78 10	13.0	.315	36	0.6
3651	57–34	09.6	−71 32	14.7	.075	187	0.7*
3659	132–48	11.8	−62 49	14.4	.056	29	0.6
3735	57–47	22.4	−72 33	14.8	.107	23	0.5
3759	31–18	21.8	−75 57	14.1	.081	108	0.6
3778	58–45	25.6	−71 02	14.8	.031	171	0.4
3780	132–22	26.9	−61 45	14.7	.038	179	0.6
3784	58–24	27.4	−70 30	15.6	.114	38	0.6
3804	132–14	30.7	−61 09	15.0	.105	140	0.7
3831	31–1	32.2	−74 52	13.5	.112	113	0.6
3856	133–57	37.1	−62 10	14.0	.022	183	0.5
3871	133–70	39.1	−62 42	15.5	.027	189	0.5
3957	32–19	47.8	−76 22	15.2	.096	63	0.6
3960	133–56	50.7	−62 09	15.1	.076	163	0.6

BPM	L	R.A. 1950	Dec	m	μ	p	I.C.
		h m	° ′		″	°	
3989	94–11	5 53.1	−65 40	13.6	0.075	113	0.7
3997	32–22	51.8	−76 39	15.1	.119	355	0.7
4064	58–4	6 00.8	−69 27	12.4	.075	347	0.6
4132	58–89	08.1	−72 12	15.0	.106	24	0.6
4154	59–64	11.9	−74 43	14.4	.023	97	0.6
4166	134–59	16.3	−62 48	13.2	.037	154	0.5
4182	134–92	19.6	−64 51	14.1	.202	88	0.5
4206	59–1	23.1	−69 47	12.9	.155	134	0.4
4222	33–82	23.1	−78 22	13.7	.100	13	0.6
4237	134–8	28.3	−60 17	13.8	.054	346	0.7
4240	59–28	27.0	−72 27	15.0	.250	38	0.7
4242	59–56	27.2	−74 01	14.9	.133	17	0.5
4267	134–53	34.6	−62 23	14.5	.150	161	0.6
4273	134–21	35.8	−61 10	13.3	.037	231	0.4
4291	33–64	35.7	−77 24	11.6	.123	16	0.2
4292	134–14	38.9	−60 40	13.8	.156	50	0.7
4302	59–16	39.4	−71 27	15.5	.038	230	0.3
4324	33–4	45.2	−74 55	13.2	.083	8	0.5
4353	135–20	53.6	−62 22	12.8	.075	4	0.3
4364	59–46	54.5	−73 26	13.9	.164	130	0.6
4383	59–25	58.1	−72 14	13.3	.107	147	0.5
4401	60–53	7 02.0	−74 15	15.3	.106	3	0.7
4406	33–36	02.9	−76 10	15.2	.111	41	0.6
4415	33–66	04.6	−77 46	13.8	.086	16	0.6
4489	33–60	16.2	−77 24	14.4	.094	329	0.6
4504	34–14	18.4	−75 42	13.6	.032	164	0.5
4524	136–10	23.6	−60 42	14.4	.073	145	0.4
4566	136–50	29.3	−62 23	13.8	.077	142	0.7
4587	61–9	31.8	−70 30	14.7	.136	3	0.7
4640	61–46	38.4	−72 25	15.2	.154	54	0.6
4652	33–56	38.8	−76 57	12.2	.314	354	0.3
4663	137–97	42.6	−63 55	14.7	.027	9	0.5
4686	137–64	46.9	−63 02	12.4	.081	359	0.3
4692	34–44	45.4	−77 34	15.2	.115	174	0.7
4699	61–67	47.1	−73 30	14.5	.127	10	0.6
4710	137–37	50.3	−61 57	13.6	.052	300	0.3
4731	61–6	52.7	−70 14	13.6	.029	152	0.6
4740	137–19	54.8	−61 10	12.7	.086	302	0.4
4765	137–78	57.9	−63 34	13.7	.065	145	0.3
4774	97–6	58.9	−66 33	14.6	.177	160	0.6
4789	61–38	59.6	−72 04	14.5	.093	336	0.5
4823	137–39	8 05.7	−62 02	13.6	.101	331	0.4
4864	137–70	10.2	−63 05	14.0	.050	153	0.4
4866	137–101	10.5	−64 00	13.9	.034	293	0.4
4877	98–66	11.4	−68 21	12.8	.070	119	0.6

BPM	L	R.A. 1950	Dec	m	μ	p	I.C.
		h m	° ′		″	°	
4891	61–76	8 14.1	−74 08	14.6	0.080	246	0.7
4900	98–73	16.9	−68 41	13.1	.137	144	0.6
4906	138–24	18.6	−62 26	12.6	.057	358	0.4
4921	138–34	20.6	−63 27	14.2	.040	135	0.7
4932	34–18	20.9	−76 08	12.1	.048	342	0.5
4952	63–25	25.1	−71 24	13.8	.029	224	0.1
4957	63–54	25.5	−72 25	12.8	.103	123	0.2
4964	63–62	26.3	−72 54	12.4	.102	304	0.3
4968	138–21	28.0	−62 04	11.8	.060	290	0.2
4983	34–53	28.7	−77 58	13.4	.090	326	0.6
4991	138–26	33.0	−62 37	13.2	.112	342	0.5
5024	98–52	37.1	−67 53	14.4	.088	345	0.6
5027	62–7	36.9	−71 14	14.1	.033	301	0.7
5088	139–5	47.6	−60 30	13.3	.126	355	0.3
5094	139–7	48.2	−62 23	13.0	.089	301	0.3
5115	62–21	49.3	−72 15	13.8	.147	331	0.4
5191	140–322	9 00.8	−63 37	13.7	.039	108	0.3
5230	140–392	04.5	−64 13	13.6	.039	144	0.5
5233	139–82	05.0	−63 52	12.1	.144	126	0.3
5242	140–437	06.0	−64 54	13.1	.052	342	0.4
5281	139–67	10.1	−63 01	12.6	.082	96	0.4
5289	140–420	10.7	−64 40	14.4	.059	312	0.4
5313	140–51	12.4	−60 49	14.5	.039	108	0.4
5325	140–447	13.0	−65 02	13.8	.073	287	0.3
5328	140–448	13.2	−65 06	14.5	.042	115	0.4
5329	140–112	13.4	−61 45	15.2	.071	152	0.6
5331	140–281	13.4	−63 18	15.0	.040	130	0.2
5342	140–44	14.3	−60 46	13.0	.093	284	0.3
5343	140–104	14.7	−61 38	14.9	.045	277	0.5
5344	140–353	14.6	−63 51	15.3	.063	110	0.3
5350	64–63	14.1	−72 14	14.0	.052	315	0.4
5357	140–234	15.2	−62 59	15.2	.177	207	0.3
5385	140–153	16.6	−62 14	15.4	.076	212	0.5
5389	99–8	16.4	−66 59	13.8	.311	333	0.4
5394	140–352	17.1	−63 50	14.9	.043	318	0.4
5405	140–331	17.5	−63 47	12.7	.076	299	0.5
5406	64–9	16.9	−70 15	15.6	.057	180	0.4
5408	140–74	17.7	−61 17	13.2	.052	11	0.5
5418	140–263	18.3	−63 13	15.3	.034	164	0.2
5423	140–351	18.6	−63 55	15.2	.040	29	0.3
5435	140–29	19.2	−60 29	12.9	.093	170	0.4
5439	36–13	17.9	−75 13	14.8	.122	322	0.6
5448	63–85	18.4	−74 43	13.6	.114	326	0.4
5478	140–416	21.3	−64 44	14.4	.041	285	0.4
5488	140–79	22.1	−61 20	15.1	.056	347	0.5

BPM	L	R.A. 1950	Dec	m	μ	p	I.C.
		h m	° ′		″	°	
5512	36–57	9 22.6	−76 50	14.4	0.073	314	0.5
5530	140–150	24.1	−62 13	14.6	.055	328	0.3
5546	140–407	25.2	−64 33	13.3	.063	306	0.4
5553	140–424	25.4	−64 45	13.8	.044	117	0.4
5575	100–89	25.9	−67 51	16.9	.047	149	0.5
5586	140–197	26.7	−62 36	14.2	.028	313	0.2
5587	100–108	26.3	−68 21	14.9	.082	121	0.5
5589	99–12	26.5	−67 14	12.6	.080	282	0.4
5618	140–228	28.2	−62 58	12.6	.082	278	0.1
5631	141–209	28.8	−64 07	13.8	.082	96	0.6
5660	140–312	30.4	−63 34	12.2	.048	112	0.2
5666	36–19	29.4	−75 44	14.5	.091	327	0.6
5702	140–413	32.5	−64 40	14.9	.086	334	0.4
5739	36–27	33.0	−75 57	15.4	.075	357	0.6
5749	140–163	34.8	−62 18	13.8	.080	296	0.5
5751	100–28	34.5	−66 18	15.8	.078	136	0.5
5758	140–401	35.0	−64 25	14.4	.030	332	0.4
5761	36–126	33.8	−79 31	13.9	.127	346	0.5
5799	140–400	37.6	−64 26	14.0	.160	308	0.4
5809	140–181	38.1	−62 24	13.7	.059	284	0.4
5828	140–324	39.2	−63 42	14.5	.044	294	0.5
5848	140–359	40.7	−63 54	14.0	.026	310	0.4
5871	141–138	41.9	−63 09	13.9	.033	149	0.2
5886	64–12	42.2	−70 39	14.7	.076	289	0.5
5887	140–338	43.1	−63 44	14.0	.078	350	0.4
5890	100–81	42.6	−67 40	17.6	.047	156	0.5
5896	141–231	43.2	−65 09	13.6	.054	296	0.4
5936	64–109	44.5	−73 38	13.2	.125	132	0.4
6024	141–133	50.8	−63 05	14.0	.023	130	0.4
6048	141–220	52.8	−64 45	13.3	.088	220	0.3
6064	141–94	54.1	−62 23	14.5	.058	260	0.5
6075	141–100	54.7	−62 37	13.9	.044	160	0.3
6076	141–124	54.7	−62 55	13.7	.058	314	0.4
6095	141–69	56.1	−61 51	13.6	.051	128	0.4
6105	64–47	56.3	−71 34	13.0	.056	142	0.4
6144	100–96	10 00.2	−68 03	15.6	.034	301	0.3
6146	100–74	00.4	−67 22	15.4	.034	249	0.4
6171	141–225	03.2	−64 50	13.4	.036	297	0.4
6180	64–42	03.7	−71 29	14.2	.156	296	0.5
6181	142–57	04.1	−62 37	13.9	.066	280	0.3
6182	141–116	04.3	−62 44	13.9	.096	307	0.6
6191	141–187	05.5	−63 52	13.6	.037	335	0.4
6193	36–45	04.3	−76 42	15.0	.049	326	0.7
6250	101–14	11.5	−66 05	13.7	.109	308	0.4
6266	142–95	13.8	−63 57	14.1	.036	290	0.4

BPM	L.	R.A. 1950	Dec	m	μ	p	I.C.
		h m	° ′		″	°	
6271	36–35	10 13.1	−76 20	16.0	0.046	308	0.7
6294	65–62	14.6	−73 32	16.8	.086	343	0.6
6304	101–33	18.1	−67 18	16.8	.092	310	0.4
6315	142–14	19.6	−61 31	13.3	.045	295	0.4
6316	65–57	19.1	−73 15	12.3	.135	320	0.2
6317	142–87	19.8	−63 47	13.4	.062	324	0.4
6320	101–29	20.7	−66 56	12.9	.070	16	0.4
6329	101–21	21.5	−66 32	17.2	.054	117	0.5
6386	142–108	27.2	−64 39	14.0	.039	253	0.3
6398	66–49	28.7	−72 32	15.3	.066	312	0.4
6407	36–61	29.7	−77 06	14.6	.434	121	0.5
6429	65–34	33.8	−72 08	14.2	.046	94	0.5
6432	36–89	34.0	−78 12	15.6	.073	109	0.6
6437	66–73	34.5	−73 50	16.9	.078	303	0.4
6446	65–49	35.2	−72 47	13.6	.180	10	0.3
6447	142–96	36.0	−64 10	14.8	.050	115	0.3
6453	37–22	35.9	−77 02	14.9	.085	294	0.4
6476	142–65	40.2	−63 06	14.4	.033	192	0.4
6477	142–94	40.2	−63 57	13.1	.063	50	0.5
6485	101–92	40.6	−69 36	13.0	.132	311	0.3
6491	66–96	40.9	−74 48	15.5	.084	277	0.5
6513	102–106	44.0	−68 10	16.3	.140	315	0.4
6525	143–81	45.4	−63 35	13.9	.083	118	0.2
6530	37–21	45.1	−77 06	14.8	.088	263	0.5
6534	66–41	45.9	−72 26	15.4	.101	334	0.6
6547	102–117	46.9	−68 29	15.3	.064	339	0.3
6586	66–48	51.1	−72 42	17.0	.042	305	0.2
6625	143–102	55.0	−64 55	13.3	.101	91	0.3
6632	143–97	55.8	−64 35	13.8	.125	244	0.3
6635	66–36	55.6	−72 03	13.7	.098	289	0.5
6648	66–71	56.5	−73 56	17.0	.083	93	0.5
6716	37–18	11 04.4	−76 50	14.7	.042	292	0.4
6717	143–93	05.1	−64 16	13.5	.104	220	0.5
6737	102–57	07.4	−67 19	14.8	.093	286	0.5*
6790	66–68	11.6	−73 31	15.4	.100	321	0.3
6809	144–128	13.7	−63 42	14.4	.071	288	0.3
6814	102–42	14.0	−67 02	16.7	.069	246	0.3
6824	102–34	15.0	−66 58	15.5	.067	298	0.2
6842	102–73	17.2	−67 38	15.2	.096	257	0.4
6850	66–88	17.8	−74 29	15.0	.084	261	0.5
6861	144–42	18.9	−61 27	13.7	.090	292	0.4
6877	144–134	19.9	−63 50	15.2	.037	286	0.3
6897	102–94	22.4	−68 00	16.3	.039	230	0.3
6900	102–162	23.1	−69 48	14.1	.087	317	0.2
6905	102–40	22.7	−67 01	14.9	.046	241	0.3

BPM	L	R.A. 1950	Dec	m	μ	p	I.C.
		h m	° ′		″	°	
6914	66–34	11 24.5	−71 55	15.0	0.099	219	0.4
6959	144–172	29.6	−65 01	13.3	.097	277	0.3
6962	144–61	30.2	−62 02	14.4	.042	351	0.3
7015	145–67	34.7	−62 02	15.8	.072	302	0.5
7019	103–72	35.2	−68 07	15.6	.044	213	0.3
7029	144–114	36.7	−63 33	14.3	.083	293	0.3
7054	103–50	38.7	−66 31	14.0	.109	123	0.2
7078	38–45	40.0	−78 16	16.2	.078	280	0.6
7080	38–20	40.8	−77 06	15.5	.129	293	0.4
7085	145–66	41.4	−62 03	15.1	.079	294	0.3
7090	145–64	41.7	−62 02	16.1	.039	266	0.4
7097	38–42	41.9	−78 07	15.6	.026	284	0.5
7100	103–66	42.5	−67 23	16.1	.089	260	0.5
7110	103–79	43.1	−68 32	14.6	.051	108	0.5
7113	145–149	43.3	−64 48	14.5	.081	109	0.5
7121	103–92	43.6	−69 54	12.5	.130	264	0.4
7122	68–59	43.9	−71 57	15.2	.042	81	0.4
7146	145–116	45.9	−63 35	15.8	.189	277	0.5
7164	38–67	47.9	−79 34	16.5	.186	272	0.5
7176	145–63	49.4	−62 07	16.3	.055	286	0.4
7179	103–17	49.5	−67 43	15.1	.071	320	0.4
7187	145–134	50.3	−64 16	16.5	.082	222	0.6
7196	145–100	51.5	−63 02	16.0	.039	264	0.5
7197	67–44	51.7	−74 22	13.1	.052	84	0.5
7221	103–80	53.6	−68 39	12.6	.078	266	0.3
7225	145–122	54.3	−63 48	16.0	.050	292	0.4
7234	103–76	55.1	−68 17	13.7	.082	263	0.2
7238	145–133	55.5	−64 13	15.3	.084	258	0.3
7259	145–47	57.2	−61 41	16.5	.028	281	0.5
7287	67–18	59.6	−72 03	15.6	.085	259	0.3
7320	68–1	12 02.6	−70 11	15.0	.047	330	0.5
7341	145–23	04.9	−60 53	14.0	.091	289	0.5
7365	146–14	07.4	−61 05	16.0	.022	14	0.4
7378	104–95	09.1	−68 51	15.3	.038	113	0.5
7390	68–68	10.5	−72 27	14.7	.109	248	0.5
7432	104–115	13.6	−69 34	13.6	.110	242	0.3
7443	104–61	14.4	−68 10	13.8	.046	269	0.5
7454	145–174	14.7	−63 13	16.8	.282	82	0.3
7504	146–117	20.1	−64 16	14.8	.067	267	0.2
7505	146–125	20.2	−64 29	17.1	.031	328	0.5
7514	104–53	20.8	−67 47	14.5	.056	278	0.5
7526	68–149	22.5	−74 20	15.7	.044	299	0.4
7561	104–117	25.5	−69 38	15.0	.111	285	0.5
7563	38–43	25.7	−78 17	14.6	.039	192	0.5
7574	146–122	25.8	−64 27	15.7	.035	347	0.4

BPM	L	R.A. 1950 (h m)	Dec (° ′)	m	μ (″)	p (°)	I.C.
7590	68–168	12 27.7	−74 48	16.2	0.030	226	0.4
7596	104–57	28.1	−68 00	14.5	.047	279	0.4
7661	68–139	33.2	−74 16	13.3	.073	213	0.5
7662	147–71	33.0	−62 26	15.8	.047	65	0.6
7668	146–58	33.6	−62 41	17.5	.055	282	0.3
7683	68–153	35.2	−74 26	13.8	.093	324	0.5
7697	105–66	35.9	−67 22	15.6	.123	164	0.6
7712	68–117	37.3	−73 40	15.4	.066	259	0.6
7714	69–85	37.6	−72 59	14.7	.072	270	0.5
7726	104–124	38.7	−65 55	14.7	.085	285	0.3
7728	104–126	39.0	−67 01	14.6	.068	274	0.6
7739	104–83	40.0	−68 38	12.5	.133	104	0.3
7751	146–38	40.7	−62 08	15.0	.088	250	0.4
7801	147–88	44.2	−62 35	16.7	.071	308	0.6
7812	105–2	45.3	−65 06	13.8	.241	300	0.2
7824	147–133	46.2	−63 16	15.4	.157	275	0.4
7844	147–78	48.0	−62 34	17.0	.105	173	0.3
7847	147–158	48.1	−63 50	15.4	.065	290	0.4
7871	69–75	50.3	−72 53	15.6	.051	327	0.6
7892	147–126	51.4	−63 11	16.1	.030	259	0.3
7911	147–39	53.0	−61 45	16.5	.045	265	0.5
7913	147–187	53.0	−64 21	15.8	.024	310	0.4
7921	39–11	54.6	−76 50	17.1	.235	5	0.7
7924	147–49	54.3	−62 01	17.1	.041	128	0.5
7930	39–35	55.9	−78 28	16.7	.087	249	0.7
7931	147–85	53.2	−62 36	16.8	.087	241	0.6
7935	69–131	55.8	−74 14	15.7	.041	114	0.5
7956	147–18	57.4	−61 23	14.0	.062	284	0.2
7959	147–47	57.5	−61 59	14.3	.046	333	0.3
7976	105–24	58.8	−66 12	14.1	.083	292	0.3
7977	147–5	58.7	−60 51	14.6	.086	147	0.2
7982	147–93	58.9	−62 44	15.7	.227	273	0.4
7983	105–73	59.0	−67 46	14.9	.040	165	0.5
7987	69–116	59.5	−73 37	16.4	.062	295	0.6
8022	147–61	13 01.4	−62 13	15.3	.039	337	0.3
8042	105–44	02.8	−66 48	16.0	.038	270	0.7
8044	148–28	02.8	−61 28	16.2	.067	238	0.5
8054	105–22	02.6	−66 08	14.4	.215	273	0.5
8059	69–46	04.1	−72 19	15.1	.043	265	0.5
8076	147–185	05.8	−64 20	14.9	.066	272	0.4
8097	148–70	08.1	−62 20	15.7	.088	245	0.3
8102	105–40	08.9	−66 43	15.4	.023	264	0.6
8126	69–162	11.5	−74 58	15.6	.070	292	0.5
8129	147–172	11.3	−64 00	14.4	.102	278	0.4
8155	148–69	13.2	−62 21	16.6	.110	256	0.5

BPM	L	R.A. 1950 Dec				m	μ	p	I.C.
		h	m	°	′		″	°	
8159	69–8	13	13.7	−70	55	12.0	0.180	266	0.4
8205	105–39		17.4	−66	34	16.1	.290	255	0.6
8257	69–157		22.4	−74	47	13.8	.075	274	0.6
8261	69–12		22.5	−71	18	13.4	.161	306	0.3
8274	69–113		23.6	−73	40	14.0	.105	255	0.7
8288	146–116		24.6	−63	52	16.2	.043	240	0.5
8307	105–76		26.4	−68	02	14.6	.215	230	0.6
8333	148–141		28.5	−64	27	12.1	.146	235	0.3
8334	148–151		28.5	−64	53	15.1	.074	269	0.3
8343	105–120		29.8	−69	41	14.6	.108	307	0.5
8363	149–152		31.3	−64	55	13.0	.073	219	0.3
8377	69–105		33.0	−73	24	15.7	.096	291	0.6
8405	148–30		34.8	−61	45	15.2	.048	280	0.4
8435	106–53		37.6	−67	13	16.2	.053	209	0.5
8512	149–93		44.2	−63	12	14.9	.064	254	0.3
8524	70–66		46.2	−73	39	14.6	.071	247	0.5
8543	106–71		47.2	−67	47	17.4	.037	244	0.6
8575	106–51		50.6	−67	12	14.2	.187	93	0.3
8582	40–128		52.3	−78	49	15.7	.066	313	0.7
8588	149–10		51.7	−60	25	16.0	.079	246	0.7
8629	149–117		55.7	−63	58	15.8	.039	251	0.5
8659	107–77		58.6	−67	43	14.3	.068	257	0.4
8663	70–155		59.5	−73	54	15.2	.067	261	0.6
8690	106–50	14	01.3	−67	13	14.4	.080	275	0.5
8709	149–79		02.9	−62	41	17.0	.119	261	0.4
8710	149–9		02.9	−60	24	15.4	.114	229	0.4
8717	149–21		03.4	−60	58	16.8	.037	214	0.5
8730	149–42		04.6	−61	36	15.8	.068	221	0.5
8753	149–33		06.3	−61	22	16.3	.128	253	0.5
8780	70–21		08.9	−71	39	14.1	.074	229	0.5
8796	70–14		09.9	−71	06	13.6	.055	245	0.4
8810	40–117		12.5	−78	31	17.0	.036	265	0.4
8814	107–132		11.7	−70	05	15.2	.052	285	0.3
8831	70–25		12.1	−71	46	14.0	.077	250	0.5
8835	40–110		15.2	−78	21	15.1	.058	257	0.5
8842	71–14		15.2	−71	54	15.2	.097	260	0.5
8844	70–62		15.8	−73	27	13.7	.162	264	0.3
8853	71–57		17.3	−75	03	17.3	.067	261	0.6
8862	149–140		17.2	−64	29	16.6	.089	265	0.3
8876	107–122		18.9	−69	25	16.0	.094	259	0.6
8884	40–40		20.3	−76	40	16.9	.113	296	0.4
8908	71–3		21.9	−70	57	16.4	.031	251	0.3
8920	107–46		23.0	−66	51	16.5	.031	198	0.6
8923	71–32		23.8	−73	07	16.4	.024	155	0.5
8939	40–31		27.7	−76	20	16.5	.117	240	0.6

BPM	L	R.A. 1950	Dec	m	μ	p	I.C.
		h m	° ′		″	°	
8949	150–37	14 26.4	−62 04	13.8	0.234	237	0.3
8951	107–127	27.1	−69 36	15.6	.091	220	0.6
8972	107–121	29.1	−69 32	16.0	.049	261	0.4
8985	107–45	30.7	−66 48	16.2	.030	224	0.5
8991	150–18	30.8	−61 13	15.1	.060	244	0.2
9006	150–76	32.2	−63 54	16.0	.064	241	0.5
9021	108–92	35.2	−67 48	13.9	.052	245	0.3
9045	71–38	38.8	−73 19	15.8	.088	248	0.5
9053	107–53	39.1	−67 03	14.5	.153	247	0.3
9065	151–120	40.0	−64 34	16.5	.105	258	0.3
9079	72–68	41.6	−73 18	13.9	.094	318	0.4
9096	41–60	44.2	−78 30	14.7	.060	257	0.4
9098	151–42	42.6	−61 58	16.2	.105	280	0.3
9125	150–99	45.4	−64 53	15.1	.145	160	0.4
9127	107–47	45.5	−66 50	15.1	.051	192	0.5
9132	108–115	46.0	−68 24	15.2	.075	102	0.5
9134	151–36	45.7	−61 51	15.4	.100	272	0.4
9142	108–141	47.2	−69 21	14.8	.070	274	0.3
9143	151–62	46.7	−62 36	16.5	.130	270	0.3
9149	41–30	48.7	−77 10	16.4	.020	184	0.4
9162	107–65	48.6	−67 23	14.7	.081	257	0.4
9163	151–21	48.5	−61 18	17.1	.154	233	0.5
9189	151–84	51.4	−63 26	17.2	.036	264	0.5
9206	151–106	52.6	−63 59	15.7	.039	261	0.4
9217	108–20	54.2	−65 40	14.2	.139	232	0.3
9225	151–57	54.6	−62 22	15.3	.184	245	0.4
9228	151–8	55.3	−60 44	17.5	.035	145	0.6
9312	151–122	15 02.4	−64 46	15.0	.126	250	0.4
9335	108–46	05.2	−66 41	14.7	.100	239	0.2
9339	41–58	07.5	−78 36	16.6	.070	333	0.6
9342	72–88	07.1	−74 40	16.0	.070	256	0.5
9344	151–44	06.0	−62 18	17.5	.103	238	0.4
9366	152–113	08.4	−65 02	13.5	.061	193	0.4
9380	108–139	10.3	−69 25	15.1	.113	230	0.5
9381	72–72	11.1	−73 33	17.3	.081	261	0.6
9384	41–86	12.9	−79 48	15.5	.059	301	0.5
9402	151–31	11.5	−61 42	15.5	.071	232	0.3
9418	152–109	13.1	−64 46	14.7	.061	245	0.3
9422	72–21	14.1	−71 39	16.3	.054	320	0.6
9426	108–12	13.8	−65 15	15.7	.062	212	0.3
9436	152–41	14.4	−61 49	16.5	.059	211	0.3
9442	73–48	16.2	−73 29	13.0	.096	230	0.2
9469	152–45	17.6	−62 00	15.4	.053	246	0.4
9491	108–71	21.0	−67 22	14.4	.116	212	0.5
9496	108–52	21.5	−66 49	16.2	.085	222	0.5

BPM	L	R.A. 1950	Dec	m	μ	p	I.C.
		h m	° ′		″	°	
9542	108–104	15 26.5	−68 13	14.9	0.070	236	0.4
9565	73–7	29.2	−70 34	12.6	.112	197	0.3
9566	108–111	29.0	−68 24	15.0	.154	237	0.5
9599	153–80	34.2	−61 50	15.3	.053	348	0.3
9609	152–77	35.9	−63 02	16.3	.027	181	0.4
9634	152–73	38.2	−62 50	15.5	.091	246	0.4
9646	153–154	39.8	−63 09	15.3	.074	227	0.2
9663	109–5	41.4	−65 44	14.7	.186	239	0.4
9677	153–49	42.3	−61 18	13.4	.106	221	0.4
9678	153–104	42.4	−62 12	16.0	.063	252	0.4
9714	42–51	49.3	−79 17	17.3	.037	291	0.6
9717	109–60	47.0	−68 32	15.8	.154	270	0.3
9737	73–49	50.1	−73 40	12.9	.088	243	0.3
9767	153–63	51.0	−61 24	16.4	.049	211	0.6
9774	153–131	52.0	−62 49	16.0	.083	251	0.5
9783	153–62	52.4	−61 27	14.9	.145	216	0.4
9788	42–40	55.4	−78 35	17.6	.056	200	0.5
9827	109–68	56.1	−68 55	14.9	.054	257	0.4
9861	74–9	59.1	−70 19	13.8	.078	122	0.4
9870	73–25	16 00.1	−72 09	12.9	.124	236	0.3
9879	74–45	00.8	−71 23	13.2	.070	203	0.6
9893	153–58	01.3	−61 28	15.5	.062	261	0.5
9896	73–12	02.3	−71 14	12.4	.458	310	0.4
9912	109–87	03.7	−70 07	14.3	.085	254	0.3
9929	73–11	05.6	−71 11	14.6	.040	258	0.2
9931	153–88	04.6	−61 59	16.4	.043	327	0.5
9937	42–8	07.0	−75 58	15.0	.090	248	0.5
9938	153–163	05.2	−63 24	15.0	.063	264	0.4
9951	153–126	06.1	−62 43	16.6	.107	243	0.3
9967	109–36	08.1	−67 29	14.2	.100	227	0.4
9983	74–171	11.3	−74 27	14.3	.074	210	0.5
9997	153–81	11.4	−61 48	16.0	.146	222	0.4
9999	110–24	11.8	−66 45	15.0	.117	203	0.5
10016	74–135	14.5	−73 31	14.4	.092	234	0.4
10020	74–185	15.1	−74 39	14.3	.061	218	0.5
10027	74–57	15.2	−71 43	12.3	.119	224	0.5
10048	74–184	18.6	−74 46	13.6	.039	207	0.5
10076	42–4	21.5	−75 43	17.1	.039	278	0.4
10112	74–83	22.9	−72 19	14.1	.051	201	0.5
10132	154–110	22.9	−63 10	15.8	.061	234	0.3
10150	74–64	26.0	−71 52	13.8	.040	183	0.9
10152	74–63	26.1	−71 51	14.0	.038	201	0.6
10174	74–8	27.4	−70 23	14.4	.044	221	0.5
10212	154–23	29.8	−61 00	13.5	.073	241	0.3
10234	154–158	31.9	−64 19	14.8	.044	224	0.6

BPM	L	R.A. 1950	Dec	m	μ	p	I.C.
		h m	° ′		″	°	
10265	74–115	16 36.1	−72 57	12.9	0.074	228	0.5
10291	110–51	37.1	−68 14	13.2	.090	252	0.4
10317	42–53	41.8	−79 17	16.8	.040	231	0.5
10383	74–80	45.6	−72 10	12.8	.076	180	0.4
10390	74–51	45.7	−71 42	13.6	.067	215	0.6
10407	74–139	47.6	−73 33	15.6	.073	231	0.4
10411	74–4	47.1	−70 09	13.2	.098	190	0.4
10435	74–58	50.0	−71 49	13.4	.048	207	0.6
10438	74–128	50.3	−73 14	14.3	.043	182	0.6
10453	111–98	51.0	−69 56	14.4	.098	198	0.3
10463	74–124	52.2	−73 03	13.6	.058	209	0.5
10506	111–55	57.0	−67 32	13.4	.048	179	0.4
10519	155–38	57.7	−61 54	15.1	.042	255	0.3
10550	111–19	17 01.7	−66 14	14.8	.107	206	0.4
10579	75–21	05.5	−71 05	13.2	.084	231	0.5
10590	76–50	08.3	−73 52	13.0	.072	239	0.5
10603	111–10	08.1	−65 42	14.5	.111	223	0.4
10605	111–30	08.6	−66 41	14.5	.038	234	0.4
10611	111–37	09.9	−66 58	14.3	.086	272	0.4
10622	111–63	11.5	−68 11	13.5	.091	200	0.4
10623	111–5	11.3	−65 17	14.4	.042	180	0.5
10632	156–23	12.1	−61 37	14.6	.058	158	0.4
10650	111–59	14.1	−67 56	14.0	.080	203	0.4
10651	75–31	14.7	−71 40	13.0	.064	187	0.5
10658	43–47	16.9	−77 40	17.0	.038	352	0.6
10673	75–67	17.3	−72 55	14.2	.061	193	0.4
10676	75–90	17.6	−73 31	13.0	.042	185	0.5
10706	75–77	20.6	−73 15	14.5	.085	244	0.4
10724	111–32	20.8	−66 44	14.5	.078	250	0.4
10736	156–47	21.7	−62 24	15.5	.080	230	0.5
10789	156–59	27.7	−62 46	15.5	.101	177	0.6
10873	156–87	37.1	−63 30	15.9	.065	210	0.5
10901	112–70	40.0	−67 16	12.7	.098	211	0.4
10928	112–50	42.2	−66 40	11.8	.124	167	0.4
10938	112–117	43.3	−69 01	13.6	.049	148	0.5
10968	112–16	45.8	−65 25	15.2	.072	234	0.5
11004	76–6	50.0	−70 26	13.4	.129	183	0.3
11005	44–62	51.9	−77 01	16.7	.036	160	0.7
11031	112–47	51.8	−66 39	13.6	.051	176	0.5
11045	76–28	53.7	−72 19	14.6	.072	222	0.6
11056	112–77	53.6	−67 28	12.6	.061	125	0.4
11090	157–61	56.8	−62 38	16.2	.075	225	0.6
11115	44–50	18 01.5	−76 41	15.2	.112	307	0.6
11148	44–16	03.9	−75 22	15.8	.078	268	0.5
11193	76–56	06.3	−74 08	14.4	.072	170	0.5

BPM	L	R.A. 1950	Dec	m	μ	p	I.C.
		h m	° ′		″	°	
11215	44–123	18 10.9	−79 47	16.2	0.113	199	0.5
11235	112–82	09.0	−67 39	13.9	.134	157	0.5
11277	76–23	13.3	−71 47	14.0	.113	191	0.4
11286	113–123	13.7	−69 04	16.2	.042	164	0.6
11308	158–23	14.3	−61 03	14.6	.102	171	0.6
11338	158–47	16.7	−61 46	14.9	.044	147	0.7
11358	113–21	18.6	−65 46	15.9	.066	134	0.6
11387	158–21	19.5	−61 10	16.4	.057	184	0.7
11390	45–60	22.0	−76 07	13.7	.067	196	0.5
11402	45–89	22.7	−77 15	15.0	.065	189	0.5
11493	113–118	26.3	−68 54	16.9	.087	189	0.4
11498	45–134	29.6	−79 01	14.6	.070	202	0.4
11514	158–57	27.6	−61 53	16.6	.084	207	0.6
11528	113–86	28.8	−67 50	17.1	.040	228	0.7
11559	158–100	30.0	−62 59	16.2	.040	275	0.6
11566	77–118	31.8	−72 55	15.4	.174	192	0.4
11612	113–115	33.8	−68 45	15.3	.110	191	0.6
11666	45–99	40.6	−77 53	15.8	.052	264	0.6
11676	113–80	39.2	−67 38	15.0	.125	270	0.6
11681	158–84	38.6	−62 35	13.3	.071	157	0.5
11685	159–137	39.0	−63 43	15.2	.051	109	0.5
11695	114–27	39.9	−65 18	15.5	.047	196	0.6
11723	113–29	42.1	−65 59	16.0	.105	108	0.8
11750	114–325	45.0	−69 43	16.2	.098	182	0.5
11755	77–168	45.9	−73 38	15.0	.171	183	0.7
11765	159–66	45.0	−62 12	16.7	.084	141	0.6
11841	159–134	50.5	−63 39	16.7	.058	206	0.7
11852	114–62	51.0	−66 06	13.5	.103	201	0.5
11862	114–279	51.8	−68 58	16.4	.052	206	0.4
11954	159–60	55.4	−62 07	15.5	.163	196	0.6
11963	77–10	56.6	−70 06	14.7	.147	207	0.6
11975	45–74	58.9	−76 59	16.4	.064	227	0.4
12005	159–163	58.0	−64 42	16.0	.064	166	0.4
12018	159–78	58.5	−62 28	16.7	.036	151	0.7
12024	159–139	58.9	−63 49	15.3	.082	198	0.3
12026	45–35	19 00.9	−75 41	12.9	.079	173	0.6
12072	114–101	02.3	−66 50	16.0	.052	181	0.7
12085	45–110	05.7	−78 09	16.0	.051	202	0.6
12109	114–68	04.3	−66 16	16.0	.045	163	0.4
12119	114–218	04.9	−68 21	16.7	.025	203	0.6
12190	114–257	09.2	−68 41	17.2	.051	121	0.6
12216	78–63	10.5	−72 33	13.9	.057	205	0.5
12226	160–46	10.4	−61 16	16.4	.073	205	0.5
12228	160–156	10.7	−64 16	15.5	.075	173	0.3
12254	114–66	12.3	−66 18	16.7	.059	218	0.6

BPM	L	R.A. 1950	Dec	m	μ	p	I.C.
		h m	° ′		″	°	
12256	79–78	19 13.3	−72 53	14.6	0.121	191	0.6
12262	114–157	12.7	−67 40	17.0	.050	163	0.4
12269	160–128	12.5	−63 24	15.8	.030	203	0.4
12271	114–224	13.2	−68 25	16.8	.071	178	0.6
12274	45–108	15.6	−77 55	14.2	.139	200	0.4
12289	159–68	13.5	−62 20	15.2	.046	211	0.6
12296	114–32	13.9	−65 47	15.5	.119	183	0.4
12332	160–127	16.3	−63 26	16.6	.047	224	0.6
12346	160–36	17.0	−60 54	15.7	.073	155	0.3
12388	79–67	20.9	−72 34	14.0	.075	225	0.6
12410	114–31	21.5	−65 41	14.0	.238	178	0.5
12436	79–112	25.0	−74 18	13.7	.053	295	0.5
12450	114–252	24.7	−68 40	12.8	.107	157	0.4
12458	160–84	24.5	−62 29	17.1	.076	144	0.5
12459	114–312	25.3	−69 34	15.8	.073	175	0.6
12474	114–262	26.3	−68 44	16.3	.078	118	0.6
12486	160–15	26.4	−60 25	17.3	.038	227	0.6
12502	78–73	29.0	−72 47	14.2	.073	258	0.6
12508	79–17	29.0	−70 54	13.6	.050	147	0.6
12540	160–7	30.2	−60 17	16.0	.155	193	0.6
12548	45–113	33.6	−77 54	12.6	.142	156	0.5
12549	79–107	32.4	−74 05	14.8	.104	222	0.5
12566	160–101	32.3	−63 01	16.4	.052	184	0.6
12579	160–37	33.3	−61 04	15.1	.134	157	0.7
12585	45–31	34.9	−74 54	15.2	.073	160	0.6
12599	79–8	35.6	−70 20	14.2	.062	172	0.4
12637	160–53	37.4	−61 38	17.9	.105	205	0.7
12655	46–59	41.1	−75 53	15.4	.085	210	0.6
12662	160–160	40.0	−64 47	15.2	.174	158	0.6
12667	160–18	40.0	−60 30	16.3	.141	140	0.5
12671	79–81	41.9	−73 16	15.1	.108	174	0.7
12704	160–133	42.4	−63 40	16.3	.115	231	0.7
12712	160–122	42.8	−63 23	17.4	.096	213	0.6
12720	115–100	43.8	−67 17	15.6	.063	166	0.7
12765	115–61	47.4	−66 34	17.7	.081	220	0.6
12809	115–153	50.8	−68 17	17.7	.050	204	0.7
12830	161–26	51.1	−61 59	17.6	.080	197	0.7
12832	161–13	51.2	−60 51	17.2	.110	194	0.7
12837	115–77	52.1	−66 53	17.7	.045	212	0.7
12839	79–61	53.1	−72 26	15.8	.062	136	0.4
12849	46–157	55.5	−78 37	14.0	.097	195	0.5
12885	79–93	57.4	−73 46	12.6	.166	164	0.4
12915	79–37	20 00.3	−71 35	14.8	.055	170	0.6
12916	79–109	01.0	−74 19	14.2	.164	216	0.5
12922	162–169	00.0	−63 27	13.5	.058	155	0.6

BPM	L	R.A. 1950	Dec	m	μ	p	I.C.
		h m	° ′		″	°	
12931	46–122	20 02.7	−77 31	15.8	0.084	215	0.4
12946	162–87	01.4	−62 19	11.7	.157	189	0.3
12958	115–124	02.5	−67 44	17.0	.110	191	0.6
12968	80–150	04.4	−73 44	16.1	.067	219	0.6
12979	80–149	05.4	−73 46	16.6	.080	178	0.4
12997	162–149	05.8	−63 15	16.2	.099	164	0.7
13000	116–111	06.5	−69 41	16.6	.070	229	0.7
13004	79–86	07.4	−73 22	12.2	.262	191	0.5
13007	80–178	08.2	−74 29	16.7	.054	162	0.7
13010	46–7	08.7	−74 29	14.4	.092	169	0.7
13050	46–150	14.2	−78 16	16.0	.289	215	0.6
13061	162–77	12.4	−62 12	15.6	.110	221	0.5
13114	116–22	16.1	−65 44	13.9	.130	176	0.6
13118	80–11	17.1	−70 20	15.8	.076	152	0.6
13140	46–53	19.3	−75 53	15.5	.055	173	0.5
13142	116–11	17.7	−65 21	15.4	.188	194	0.5
13146	162–106	17.7	−62 40	16.8	.074	162	0.7
13167	162–22	19.0	−60 47	16.3	.054	195	0.6
13182	80–104	21.4	−72 53	17.3	.051	209	0.7
13199	80–6	21.7	−70 01	15.0	.066	127	0.4
13235	162–127	22.8	−63 02	18.0	.076	159	0.7
13239	46–102	24.6	−77 04	14.2	.163	168	0.6
13263	162–137	24.6	−63 15	17.5	.062	196	0.7
13275	162–229	25.4	−64 45	16.6	.189	96	0.3
13325	80–41	29.7	−71 22	16.3	.052	119	0.5
13367	80–31	32.6	−71 07	16.7	.053	231	0.7
13377	80–102	32.5	−72 49	16.9	.100	185	0.7
13383	80–121	34.1	−73 23	16.7	.078	223	0.5
13390	80–30	34.2	−71 04	15.9	.052	175	0.5
13410	162–14	34.5	−60 39	16.7	.209	181	0.6
13439	162–44	35.8	−61 32	16.9	.067	174	0.7
13447	80–101	37.3	−72 51	15.0	.094	147	0.6
13459	162–56	36.9	−61 52	15.0	.110	177	0.6
13469	162–189	37.4	−63 55	16.2	.065	190	0.4
13502	116–123	40.8	−69 43	15.5	.065	173	0.6
13524	80–92	42.8	−72 29	17.6	.089	209	0.5
13531	47–106	45.0	−79 01	12.8	.120	158	0.4
13532	162–212	42.4	−64 26	15.2	.095	103	0.5
13555	117–132	45.0	−67 52	16.7	.060	124	0.7
13591	80–28	48.1	−70 57	13.1	.074	298	0.6
13616	117–44	49.1	−66 20	16.5	.041	170	0.7
13650	163–28	51.9	−60 51	15.0	.123	211	0.5
13664	163–82	53.4	−62 39	15.9	.089	165	0.7
13682	117–89	55.2	−67 19	13.7	.062	146	0.6
13696	117–127	56.8	−67 58	17.3	.066	156	0.5

BPM	L	R.A. 1950 h m	Dec ° ′	m	μ ″	p °	I.C.
13703	81–50	20 57.9	−72 40	13.2	0.175	289	0.5
13739	117–96	21 00.4	−67 22	16.1	.065	232	0.7
13746	117–79	00.7	−67 02	16.8	.071	138	0.6
13760	47–3	02.8	−74 33	14.2	.120	172	0.5
13769	117–111	02.9	−67 42	14.9	.060	147	0.6
13788	117–35	04.3	−66 14	16.9	.045	234	0.6
13789	117–83	04.5	−67 12	16.3	.057	145	0.7
13822	117–110	06.6	−67 36	14.9	.097	146	0.7*
13849	164–121	08.6	−63 06	16.7	.124	158	0.6
13880	117–72	12.1	−66 47	12.1	.198	181	0.5
13888	117–40	12.5	−66 20	17.2	.102	180	0.7
13908	117–102	14.6	−67 28	11.9	.162	260	0.3
13942	164–112	17.0	−62 49	16.2	.054	236	0.6
13955	164–58	17.6	−61 29	15.3	.102	229	0.5
13958	81–29	18.7	−71 23	12.9	.102	92	0.5
13961	164–135	18.2	−63 35	15.7	.086	214	0.5
13962	81–43	19.0	−72 21	14.2	.078	159	0.6
13964	117–70	18.7	−66 44	15.7	.067	163	0.7
13994	47–16	21.8	−75 21	12.4	.095	303	0.4
13999	164–119	20.6	−63 15	16.9	.052	157	0.7
14000	117–163	21.0	−68 36	15.5	.051	210	0.5
14001	164–31	20.6	−60 52	14.5	.099	149	0.6
14002	164–62	20.6	−61 35	15.5	.072	132	0.5
14045	118–94	24.5	−66 29	14.0	.087	170	0.3
14056	164–46	24.9	−61 12	12.6	.066	106	0.5
14059	164–132	25.1	−63 32	15.1	.143	159	0.6
14083	164–49	27.4	−61 20	15.9	.055	216	0.5
14101	81–39	29.4	−71 57	13.6	.143	136	0.6
14102	81–51	29.5	−72 50	13.8	.052	167	0.6
14114	164–33	29.4	−61 01	15.9	.037	157	0.6
14128	164–148	30.9	−64 04	15.3	.063	191	0.6
14210	48–16	38.0	−75 25	12.2	.055	155	0.6
14218	164–101	37.1	−62 41	15.2	.098	118	0.5
14219	164–130	37.1	−63 24	13.1	.086	130	0.5
14268	118–198	41.2	−68 25	16.5	.086	245	0.7
14270	164–137	41.0	−63 37	13.4	.104	148	0.4
14303	165–22	41.9	−61 01	16.0	.068	266	0.6
14315	82–6	44.5	−70 12	14.4	.156	173	0.7
14319	118–181	44.5	−68 03	16.4	.057	248	0.7
14360	82–2	47.5	−70 09	13.7	.060	179	0.6
14377	165–115	48.4	−63 46	16.6	.205	147	0.5
14385	118–195	49.3	−68 22	15.5	.045	179	0.5
14391	118–140	49.5	−67 21	15.5	.046	92	0.3
14398	165–21	50.0	−60 59	15.3	.074	175	0.5
14417	118–75	51.4	−66 19	16.5	.128	84	0.6

BPM	L	R.A. 1950	Dec	m	μ	p	I.C.
		h m	° ′		″	°	
14441	165–154	21 53.0	−64 44	15.2	0.126	247	0.5
14501	165–64	56.7	−62 27	16.8	.054	240	0.7
14596	83–23	22 05.2	−71 24	14.4	.092	194	0.7
14599	118–143	05.4	−67 22	16.0	.062	127	0.6
14659	48–91	13.4	−78 31	15.9	.081	110	0.7
14698	119–149	15.7	−67 46	15.2	.059	174	0.6
14732	119–227	19.7	−69 46	15.9	.101	133	0.7
14755	119–71	21.3	−66 35	16.4	.064	208	0.4
14772	48–77	23.8	−78 06	15.2	.242	136	0.7
14801	119–70	25.1	−66 33	14.8	.094	345	0.5
14806	119–8	25.6	−65 20	13.5	.101	123	0.6
14890	119–77	31.5	−66 44	15.9	.044	228	0.7
14907	166–68	32.2	−62 13	14.6	.066	120	0.7
14917	119–75	33.3	−66 45	15.1	.065	146	0.6
14955	166–53	35.3	−61 44	15.0	.074	96	0.6
14957	119–53	35.5	−66 12	13.5	.088	223	0.6
14959	49–70	36.6	−77 10	15.7	.097	105	0.6
14978	166–15	37.5	−60 12	12.8	.074	182	0.4
15010	120–151	40.0	−68 31	14.6	.033	280	0.5
15057	84–25	44.0	−71 50	15.2	.147	127	0.7
15059	119–106	44.0	−67 11	15.3	.070	40	0.6
15061	120–108	44.2	−67 41	14.7	.061	205	0.5
15062	167–79	44.1	−61 43	15.3	.027	70	0.5
15081	167–101	46.0	−62 16	15.8	.076	126	0.5
15093	84–39	46.8	−72 15	15.6	.124	172	0.6
15106	49–120	48.6	−78 35	14.8	.057	88	0.5
15123	83–4	49.0	−70 08	14.6	.080	234	0.6
15174	167–44	52.3	−60 57	14.5	.085	87	0.5
15254	167–133	59.2	−63 12	14.6	.124	96	0.7
15265	84–35	59.2	−72 14	17.0	.105	126	0.4
15268	167–163	23 00.1	−64 14	13.7	.108	127	0.4
15269	120–62	00.2	−66 40	13.8	.044	255	0.5
15302	120–32	01.8	−65 56	15.7	.114	68	0.6
15342	167–147	03.6	−63 32	14.8	.042	87	0.6
15371	49–81	08.4	−77 32	14.8	.128	113	0.7
15422	168–23	10.8	−61 04	14.9	.068	142	0.7
15439	167–117	12.0	−62 48	14.6	.077	170	0.6
15449	49–23	12.9	−75 44	16.0	.079	198	0.7
15450	120–111	12.7	−67 55	16.8	.148	164	0.6
15475	121–22	14.3	−67 05	13.9	.151	98	0.7
15482	26–82	23 15.9	−78 08	14.6	.168	198	0.6
15512	168–36	17.0	−62 12	13.4	.042	158	0.5
15519	85–23	18.5	−70 54	12.7	.081	85	0.5
15527	168–53	18.7	−63 22	14.0	.107	129	0.6
15683	85–117	33.8	−73 02	14.4	.056	147	0.5

BPM	L	R.A. 1950 Dec			m	μ	p	I.C.
		h m	°	′		″	°	
15739	85–46	23 38.5	−71	30	14.8	0.099	142	0.7
15741	169–107	38.5	−63	04	15.3	.050	106	0.6
15787	169–55	42.5	−61	41	13.8	.049	110	0.7
15869	26–59	49.8	−77	14	14.6	.070	112	0.7
15892	85–22	52.1	−70	57	13.4	.082	106	0.7

Notes to the Table

2452 For this star a color index of +1.3 was estimated from Cordoba plates (Ap.J.,96:57, 1942) but it now appears that this estimate is based on an erroneous identification of the proper motion star which is actually much bluer.

3492 This star forms a wide pair with BPM 3489, the latter star is red.

3651 This star forms a wide pair with BPM 3645, the latter star is red.

6737 This star forms a wide pair with BPM 6741 which appears to have a color index of around +1.0.

13822 This star forms a wide pair with BPM 13826, the latter is red.

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